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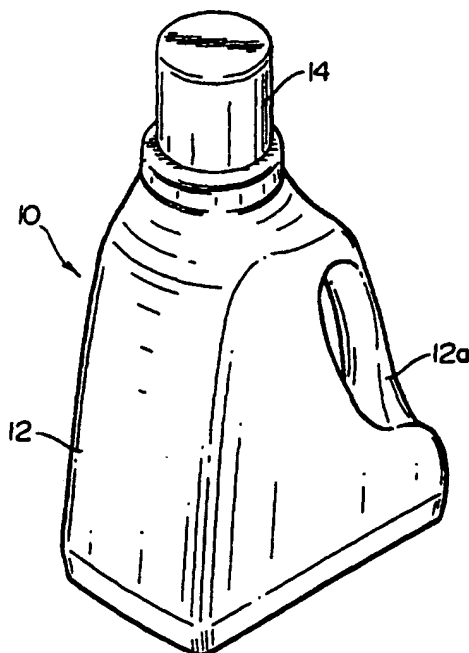
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[Continued on next page]

(54) Title: RECHARGEABLE DISPENSING DEVICE



(57) Abstract: The present invention is directed to a rechargeable dispenser including a cap removably connected to a bottle having an upwardly extending flange. The cap is provided with at least one reservoir to be compromised by the spout of the bottle to release chemical concentrate in the bottle for charging the rechargeable dispenser when mixed with a diluent such as water within the bottle.

WO 01/23295 A2

**WO 01/23295 A2**

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*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

received by the cage for introduction of the chemical to the wash bin of the washing machine.

The present invention is directed to a rechargeable dispenser including a bottle and a removably connected cap. The opening of the bottle is provided with a spout to facilitate pouring of the chemical product from the bottle. The spout extends upwardly from the opening of the bottle, and is protected by the cap when the cap is assembled onto the bottle. The rechargeable dispenser according to the present invention includes a reservoir for containing chemical concentrate or containing chemical concentrate associated with the rechargeable dispenser. Specifically, the reservoir can be a separate stand alone item sold separately from the rechargeable dispenser, however, the reservoir is configured to connect with the rechargeable dispenser in some manner. The reservoir may be packaged with the rechargeable dispenser, may be connected on the outside of the rechargeable dispenser (e.g. tied, glued, mechanically fastened), and/or can be provided within the rechargeable dispenser. The reservoir is preferably provided within the rechargeable dispenser, for example, within the cap and/or bottle. A preferred embodiment provides one or more reservoirs in the cap. More preferably, the cap is configured in such a manner that the one or more reservoirs can be compromised by the spout of the bottle.

A preferred system includes providing a cap with a removable cartridge having at least one reservoir. The cartridge is configured to fit within the cap, and is preferably removable so that the cartridge can be replaced within the cap while allowing the cap to

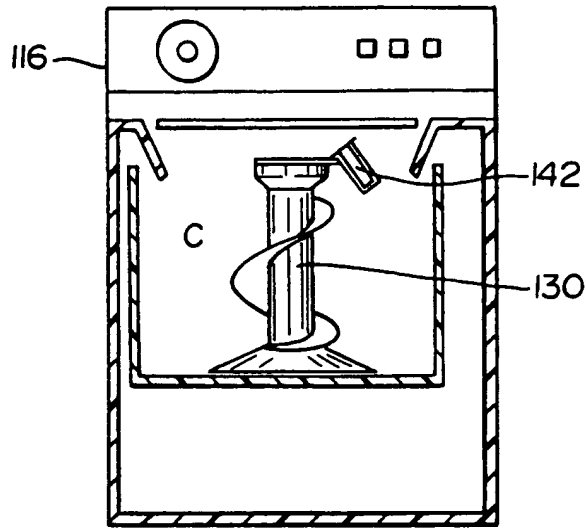


FIG. 23

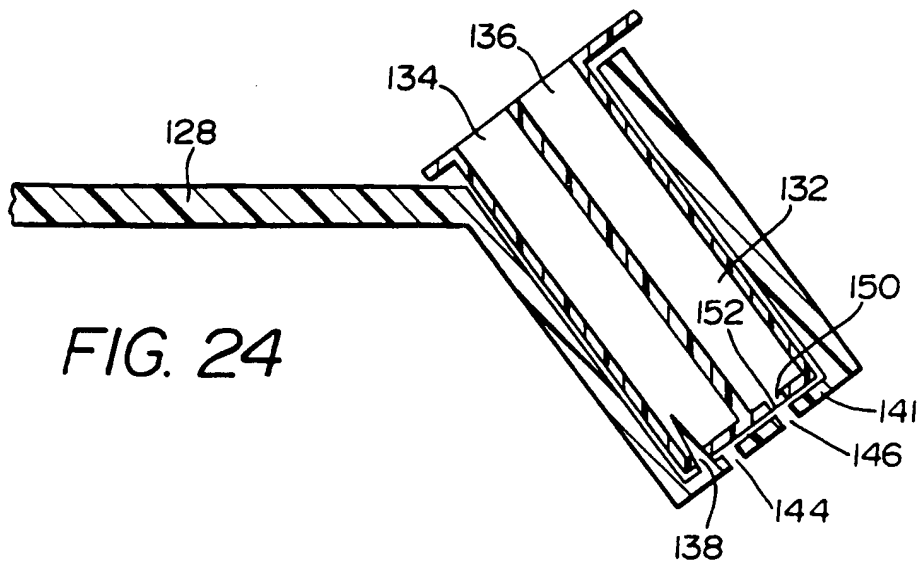


FIG. 24

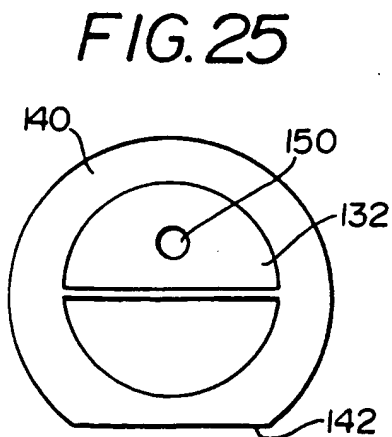
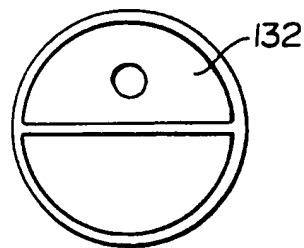


FIG. 26



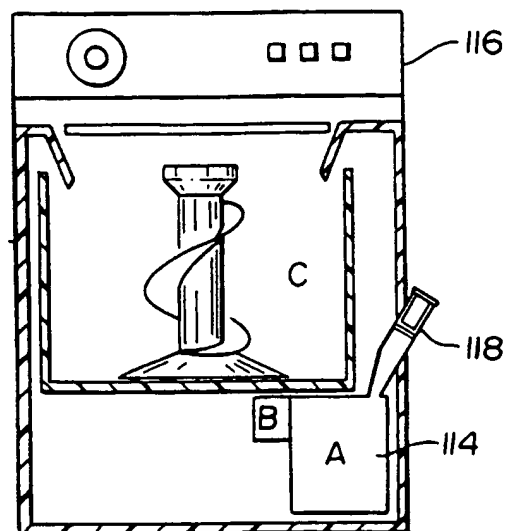


FIG. 21

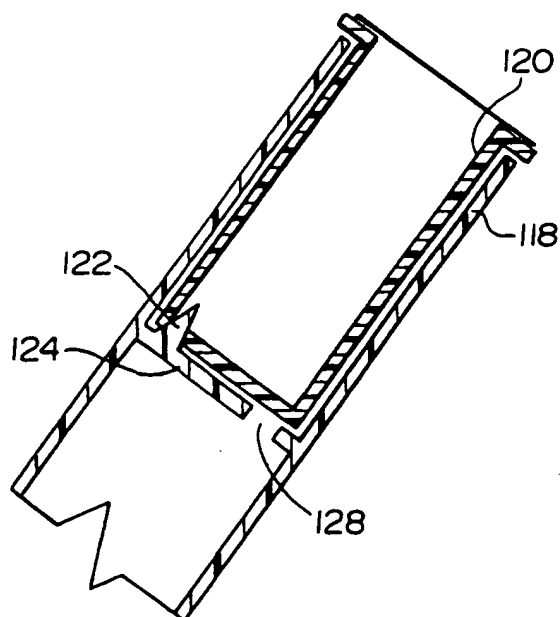


FIG. 22

FIG. 17

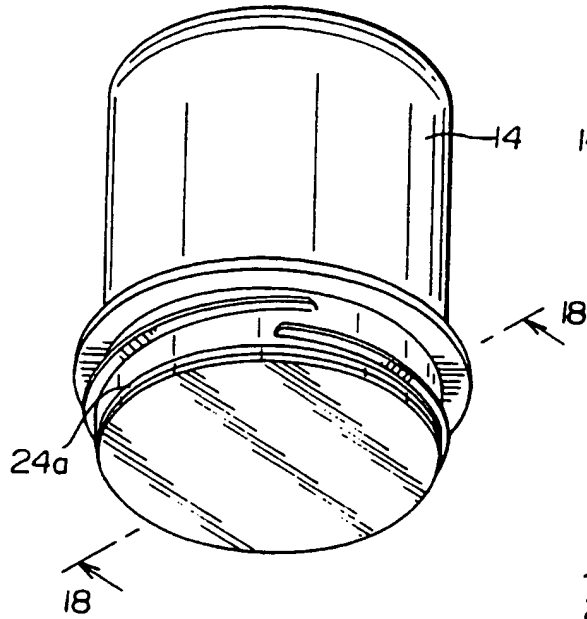


FIG. 19

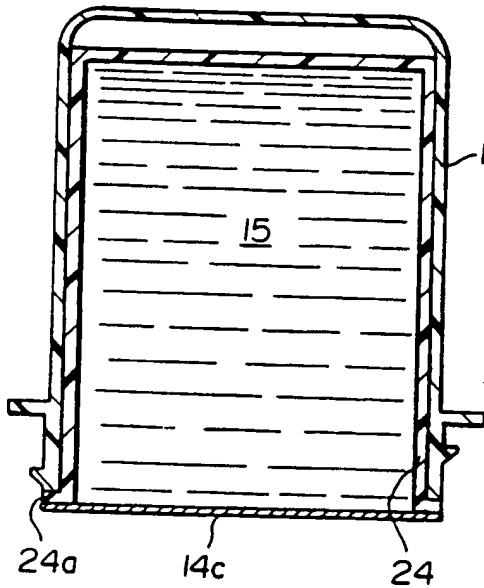
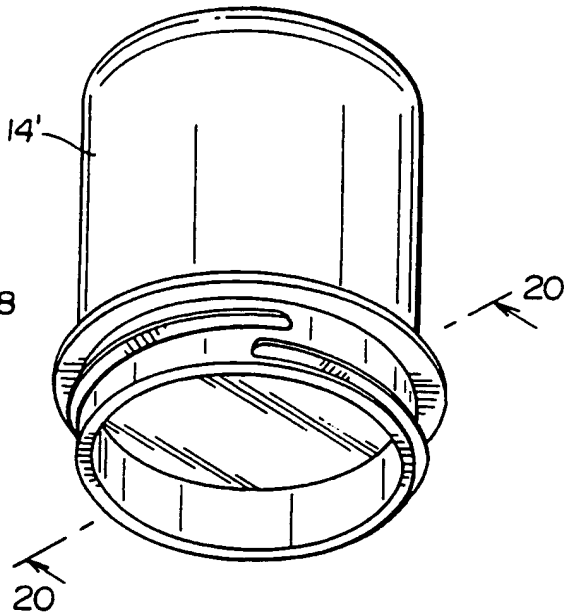


FIG. 18

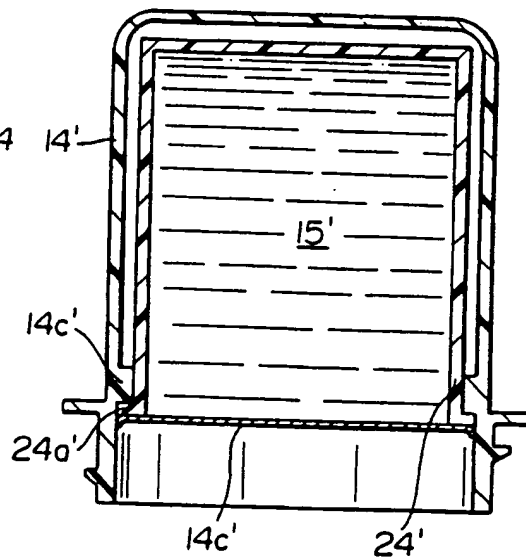


FIG. 20

FIG. 14

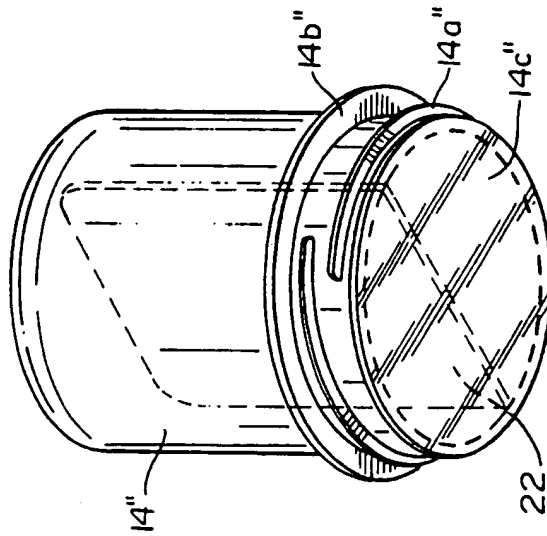


FIG. 15

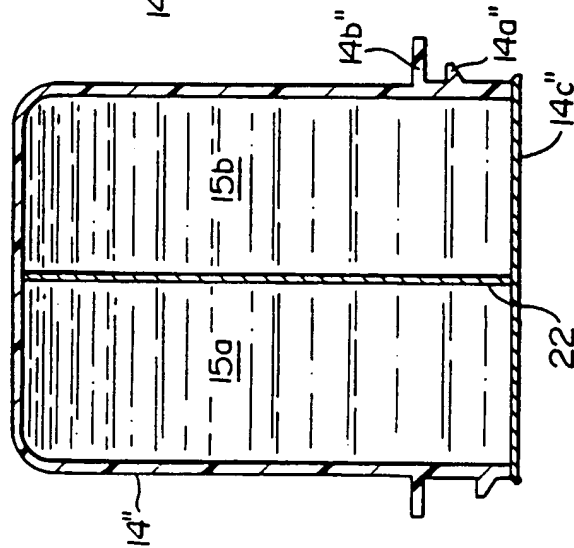


FIG. 16

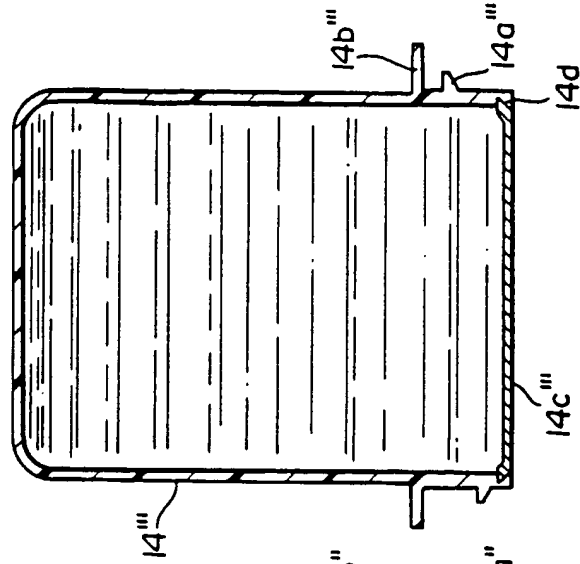


FIG. 10

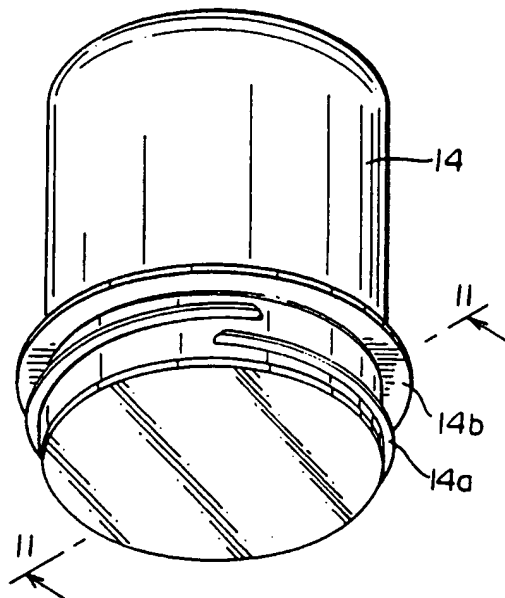


FIG. 12

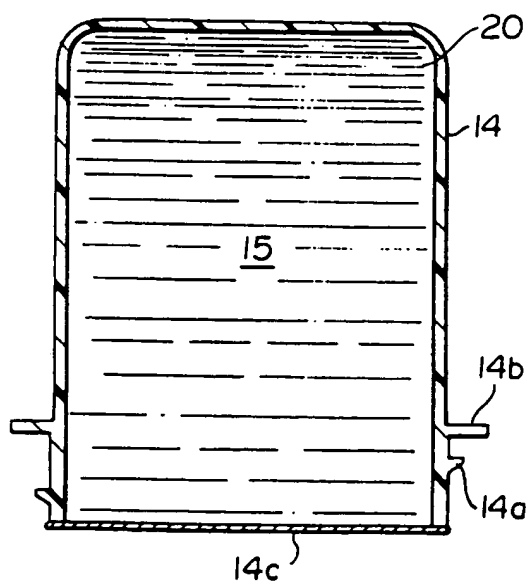
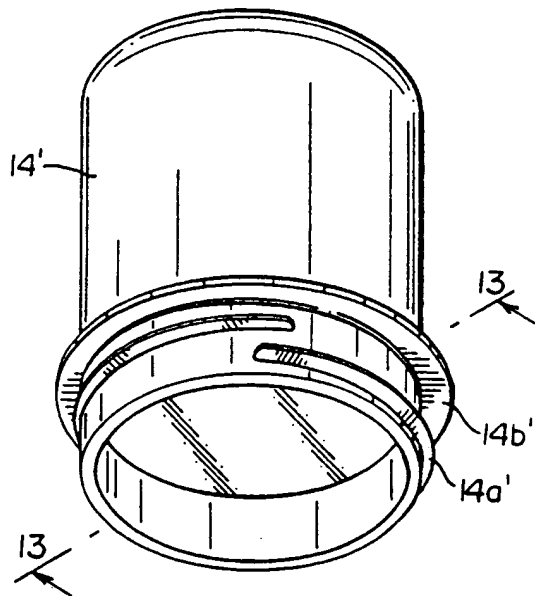


FIG. 11

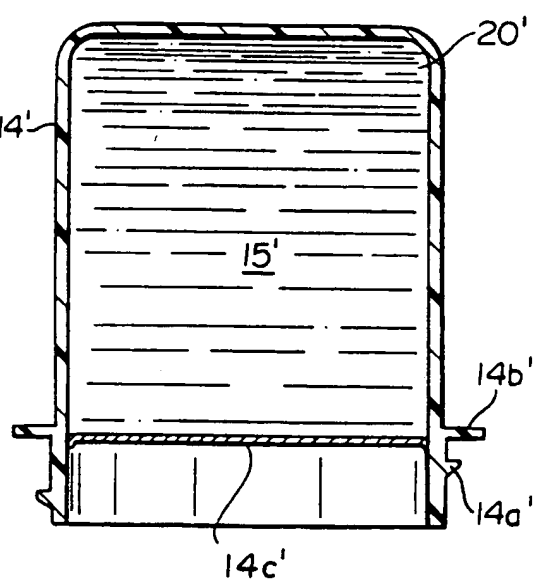


FIG. 13



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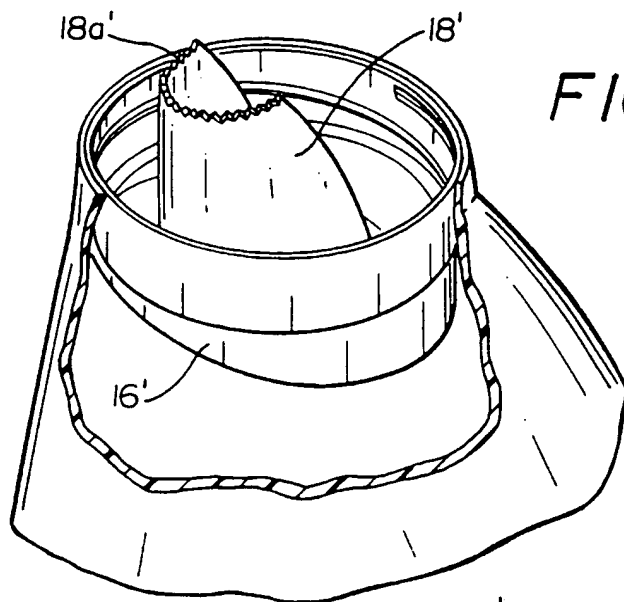


FIG. 6

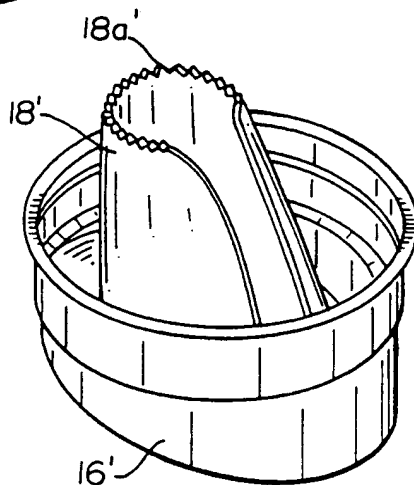


FIG. 7

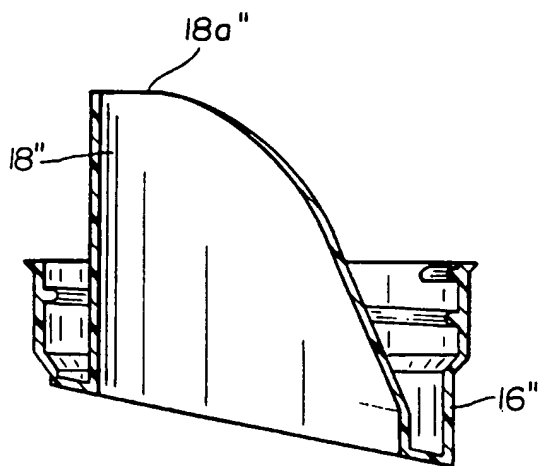


FIG. 8

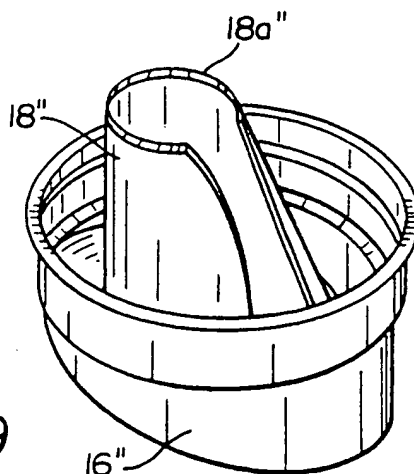


FIG. 9

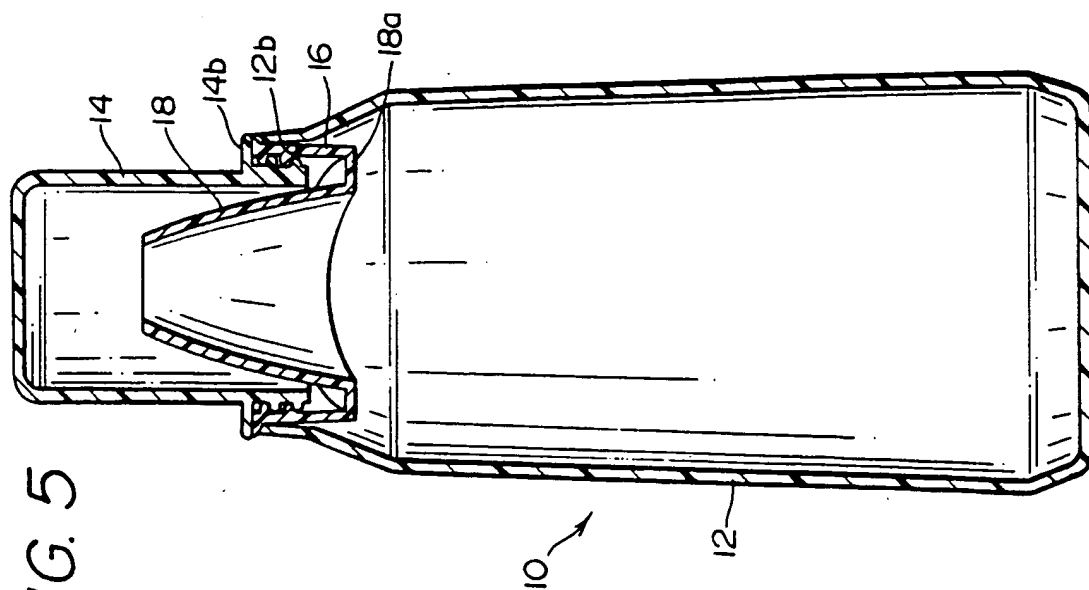


FIG. 5

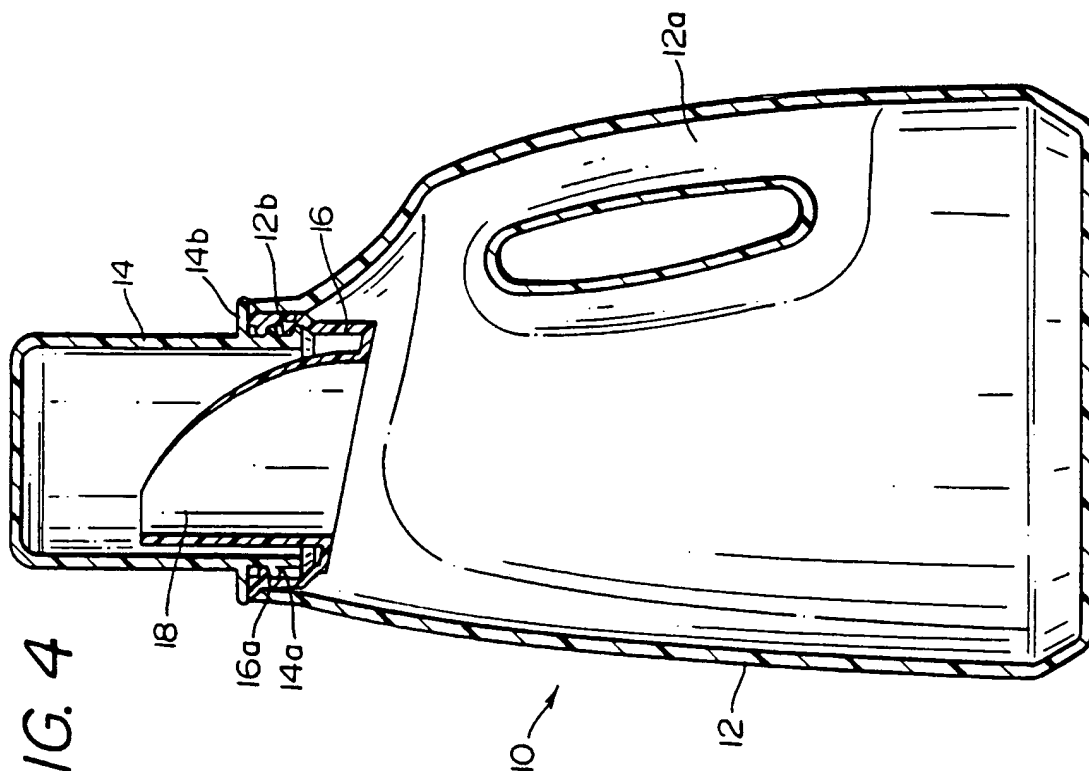


FIG. 4

FIG. 1

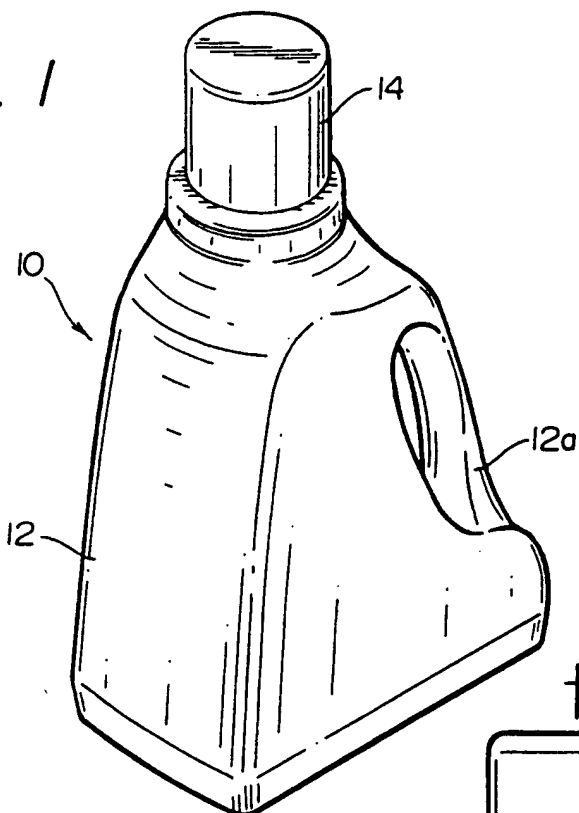


FIG. 2

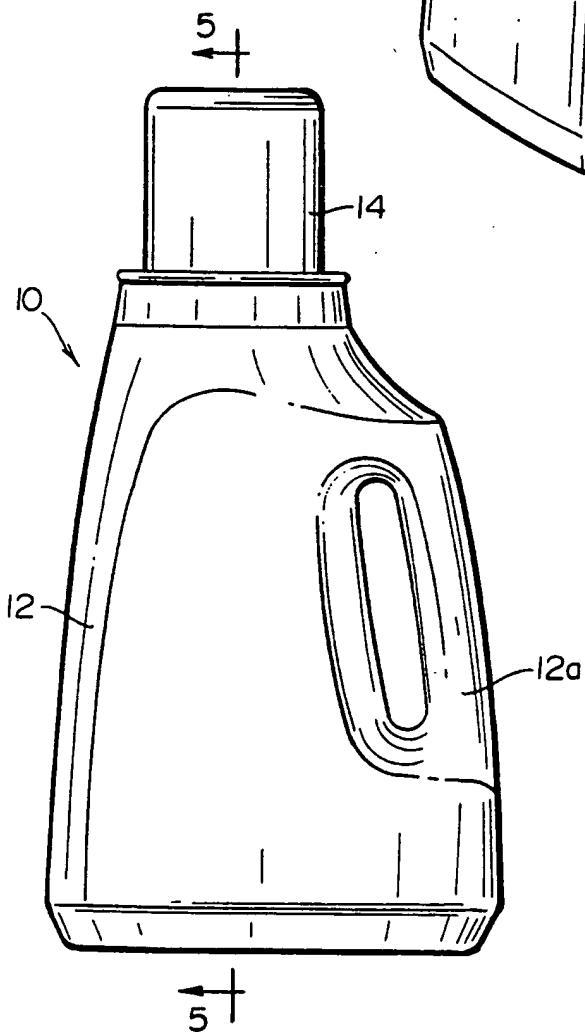
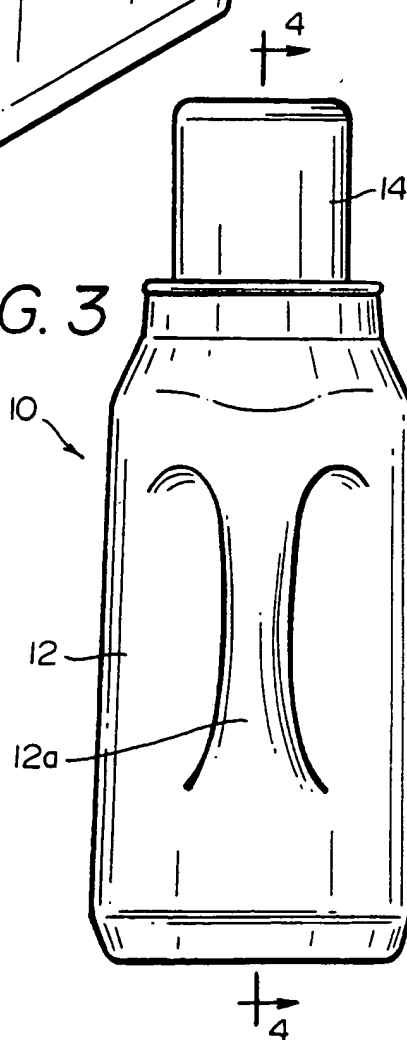


FIG. 3



33. A rechargeable dispensing apparatus according to claim 33, wherein

said cage is mounted to an agitator within said wash bin.

34. A rechargeable dispensing apparatus according to claim 34, wherein

said second reservoir is compromised by centrifugal force.

5 35. A rechargeable dispensing apparatus according to claim 35, wherein

said second reservoir contains a rinsing agent.

36. A rechargeable dispensing apparatus according to claim 35, wherein

said second reservoir contains a fabric softener.

a cartridge containing a chemically concentrated detergent and configured to be releasably received by said detergent tank for dilution of said chemically concentrated detergent in said detergent tank.

29. A rechargeable dispensing apparatus, comprising:

5 a cage in fluid communication with a wash bin of a washing machine; and

a cartridge including at least one chemical reservoir and configured to be releasably received by said cage for introduction of said chemical to a wash bin of said washing machine.

30. A rechargeable dispensing apparatus according to claim 30, wherein

10 said cartridge includes a first reservoir containing a detergent.

31. A rechargeable dispensing apparatus according to claim 31, wherein

said first reservoir is compromised upon receipt by said cage.

32. A rechargeable dispensing apparatus according to claim 31, wherein

said cartridge includes a second reservoir containing a secondary chemical.

18. The apparatus according to claim 2, said spout configured for opening said reservoir when said cap is being connected to said bottle.

19. The apparatus according to claim 17, wherein said spout is provided with teeth for opening said reservoir.

5 20. The apparatus according to claim 17, wherein said spout is provided with a sharpened surface for opening said reservoir.

21. A laundry detergent dispensing apparatus, comprising:

a bottle;

a cap removably connected to said bottle;

10 a reservoir containing concentrated laundry detergent configured to connect to the laundry detergent dispensing apparatus.

22. The apparatus according to claim 21, wherein said reservoir is provided within the laundry detergent apparatus.

15 23. The apparatus according to claim 22, wherein said reservoir is provided within said cap.

11. The apparatus according to claim 7, wherein said spout is configured to rotate within said opening of said bottle.

12. The apparatus according to claim 9, wherein said spout is configured to rotate within said opening of said bottle.

5 13. The apparatus according to claim 1, wherein said spout is configured to open said reservoir.

14. The apparatus according to claim 2, wherein said spout is configured to open said reservoir in said cap.

10 15. The apparatus according to claim 4, wherein said spout is configured to open said cartridge.

16. The apparatus according to claim 1, wherein said spout is provided by a bottle opening insert including a spout, said bottle opening insert configured to connect with said opening of said bottle.

15 17. The apparatus according to claim 1, said spout configured for opening said reservoir.

5. The apparatus according to claim 2, wherein said reservoir is provided with a cartridge, said cartridge configured to connect with said cap.

6. The apparatus according to claim 5, wherein said cartridge is removably connected to said cap.

5 7. The apparatus according to claim 4, wherein said cartridge is configured with multiple reservoirs to allow selective opening of each reservoir to allow multiple recharging of the rechargeable dispensing apparatus.

8. The apparatus according to claim 4, wherein said cartridge is configured with multiple reservoirs to allow selective opening of plural reservoirs to allow mixing of  
10 multiple components within said rechargeable dispensing apparatus.

9. The apparatus according to claim 5, wherein said cartridge is configured with multiple reservoirs to allow selective opening of each reservoir to allow multiple recharging of the rechargeable dispensing apparatus.

10. The apparatus according to claim 5, wherein said cartridge is configured with  
15 multiple reservoirs to allow selective opening of plural reservoirs to allow mixing of multiple components within said rechargeable dispensing apparatus.



*What is Claimed is:*

1. A rechargeable dispensing apparatus, comprising:

a bottle provided with an opening;

a cap removably connected to said bottle;

5 a spout connected to said bottle, said spout extending outwardly from said opening  
of said bottle; and

at least one reservoir for containing concentrate, said reservoir configured for  
connecting with the rechargeable dispensing apparatus.

2. The apparatus according to claim 1, wherein said at least one reservoir is provided  
10 within said cap.

3. The apparatus according to claim 1, wherein said cap is provided with multiple  
reservoirs.

4. The apparatus according to claim 1, wherein said reservoir is provided within a  
cartridge, said cartridge configured to connect with the rechargeable dispensing apparatus.

angled outwardly to ensure that the force vector associated with spinning agitator 130 acts significantly upon foil 152.

configured to automatically charge tank, A, with water upon receipt of a cartridge in fill tube 118.

A further alternative embodiment of a rechargeable dispensing apparatus 142 is shown in Figs. 23-26. Preferably, rechargeable dispensing apparatus 142 includes a cage portion 128 which is mounted to an agitator 130 within a wash bin, C, of a washing machine 116. Cage portion 128 is therefore in fluid communication with wash bin, C, of washing machine 116. As shown in Fig. 24 cage portion 128 is configured to receive an alternative embodiment of a cartridge 132 according to the present invention. Preferably, cartridge 132 includes at least one chemical reservoir. In the embodiment shown in Figs. 24-26, cartridge 132 includes a first reservoir 134 containing detergent and a second reservoir 136 including a secondary chemical such as a rinsing agent or a fabric softener. It is important to note that cartridge 132 includes a flange 140 having a flat side 142 which allows cartridge to be loaded into cage portion 128 in only one orientation as shown in Figs. 24-25. As shown in Figs. 24-26, reservoir 134 is configured to be compromised by a piercing element 138 included in a floor 141 of cage portion 128

Reservoir 136 is specifically configured to compromise under the centrifugal force generated by agitator 142 during a spin cycle of washing machine 116. Specifically, a hole 150 is covered by a foil 152 which tears under significant centrifugal force thereby allowing the secondary chemical within reservoir 136 to be released out of hole 146 in floor 141 of cage portion 128. It is important to note that cage portion is specifically

dispenser to form a second batch of ready-to-use product. Thus, the cap 14" can provide two full recharges of the rechargeable dispenser.

Fig. 21 shows an alternative embodiment of a rechargeable dispensing apparatus 140 according to the present invention. As shown schematically in Fig. 21, rechargeable dispensing apparatus 114 includes a detergent tank, A, in fluid communication with a wash bin, C, of a washing machine 116. Mounted peripherally of detergent tank 114 is a pump, B, for introducing detergent held in tank, A, to wash bin, C. Preferably, washing machine 116 is configured to control the operation of pump, B, as a function of the wash cycle selected by the user of machine 116. The portion of detergent introduced to wash bin, C, may thereby be accurately controlled, i.e. no user portioning of detergent.

Preferably detergent tank, A, includes a fill tube 118 which is configured to releasably receive a cartridge 120 filled with a chemically concentrated detergent as shown in Fig. 22. In the preferred embodiment shown in Figs. 21 and 22, a piercing element 122 is included on a stop wall 124 in fill tube 118. Thus, when concentrate cartridge 120 is inserted into fill tube 118, piercing element 122 pierces the floor 126 of cartridge 120 and allows the concentrate therein to be released into fill tube 118. Specifically, the detergent concentrate flows through a hole 128 in floor 124 and into detergent tank, A. Cartridge 120 may then be removed and a diluent, specifically water, may be introduced in the proper quantity through fill tube 118 to tank, A, to dilute the detergent concentrate in the tank, A. Alternatively, washing machine 116 may be

such as water. An optional fill line can be molded into the bottle 12 to show the proper fill level for the diluent. A cap 14 containing chemical concentrate is positioned over the spout 18, and then pressed downwardly so that the upper edge of the spout 18 engages with the sealing membrane 14c. The cap 14 is further pressed down so that upper edge of the spout 18 cuts through the sealing membrane 14c allowing the chemical concentrate to drain from the cap 14 into the bottle 12 and then mixed with the diluent contained therein. The cap 14 is tightened onto the bottle 12, and then the container is shaken to agitate the mixture to provide complete mixing thereof. After mixing, the rechargeable dispenser contains a full charge of ready-to-use chemical product to then be dispensed from the rechargeable dispenser by removing the cap 14 and then pouring chemical product from the spout 18 by tipping the bottle 12 using the handle 12a.

The multiple reservoir cap 14" shown in Figures 14 and 15 can be utilized by positioning one of the reservoirs 15a or 15b over the spout 18. It is noted that the spout 18 shown in Figure 4 would need to be modified so as to be only half the width shown to be utilized with the two reservoir cap 14" shown in Figure 15. One of the reservoirs 15a or 15b is then forced downwardly so that the modified spout 18 punctures the sealing membrane 14c" of that particular reservoir to release one charge of chemical concentrate into the bottle. This procedure makes one entire rechargeable dispenser of ready-to-use product. After complete usage of the chemical product, the cap 14" is removed and diluent such as water is added to the bottle 12 and then the remaining reservoir is compromised to provide a second charge of chemical concentrate to rechargeable

One Shot Solution - 37g A, 47g A2, 10g B, 8g C, 6g D, 2g E

25g of one shot solution was added to 750ml of water. The resulting liquid laundry detergent appeared to clean oily and soil stains better than TIDE. The background was as white as TIDE.

5 ***Example 4***

Part A3 - Standapol ES-2 (Henkle-Sodium Laureth 2-Sulfate-anionic surfactant)

One Shot Solution - 37g A, 47g A3, 10g B, 8g C, 6g D

25g of one shot solution was added to 750ml of water. The resulting liquid laundry detergent appeared to clean oily and soil stains better than TIDE.

10

We have also formulated dishwashing liquids using similar formulas. To achieve a heavier body and more viscous solution, we increased the ratio of Parts B and C, to Parts A and D. We could vary the viscosity from a thick pouring liquid (e.g. DAWN) to a gel (e.g. JELLO).

15 ***Operation***

The rechargeable dispenser according to the present invention is preferably operated as follows. The bottle 12 of the rechargeable dispenser 10 is filled with a diluent

One Shot Solution - 37g A, 57 B, 8g C, 6g D

25g of one shot solution was added to 750ml of water. The resulting liquid laundry detergent appeared to clean oily stains better than TIDE. However, TIDE cleaned soil stains better than this one shot.

5 We have been able to improve this formula by significantly reducing the amount of Acusol (Part B), and converting the weight saving entirely to cleaning surfactants while maintaining a viscous solution.

*Example 2*

Part A - 15g 1625FE  
10 8.5g SXS

One Shot Solution - 37g A, 47g A2, 10g B, 8g C, 6g D

25g of one shot solution was added to 750ml of water. The resulting liquid laundry detergent appeared to clean oily and soil stains better than TIDE. TIDE had a slightly whiter background.

15 *Example 3*

Part E - Optical brightener (Ciba Geigy)

bottle is large enough to hold about 200 grams, which is capable of providing two separate charges of chemical concentrated product.

*Example 1*

5	Part A -	55g	625 FE (Henkel-Polyglycoside-nonionic surfactant as detergent)
		5.5g	SXS (Stepan-Sodium Xylene Sulfonate-Hydrotrope solubilizer)
		35g	Ninol 40-CO (Stepan-Coco Diethanolamide-nonionic surfactant)
		10g	Salts (Anti-corrosive solution of 72g Water, 7g EDTA, 29g Sodium Metasilicate)
		5g	Standapol A (Ammonium Lauryl Sulfate-anionic surfactant)
10		5g	Ammonium Hydroxide (28% solution to adjust PH - Acusol thickens in final solution as a function of PH)
	Part B -	4.5g	Acusol 820 (acrylic polymer thickener)
		6g	2Butoxyethanol
	Part C -		Ammonium Hydroxide 28% Solution
15	Part D -	0.6g	Violet Dye (Pylam Products)
		0.4g	Cherry Red Dye (Pylam Products)



*Chemical Products*

In order to practically implement the rechargeable dispenser according to the present invention, it is important that the resulting ready-to-use mixed product is at least as effective and similar in consistency with conventional ready-to-use products sold today.

5 In order to provide a ready-to-use product having a similar consistency with conventional ready-to-use products premixed at the factory, it was decided that a thickening process would need to be implemented when mixing the concentrated chemical with a diluent such as water within the rechargeable dispenser according to the present invention. In general, to make a solution more viscous one either adds a very thick syrup which is diluted or a  
10 two-part solution which thickens when mixed. In the present invention, a free flowing one-shot is utilized that is even less viscous than the diluted solution. The one-shot is stable as a one-part solution.

In the present invention, Acusol 820 (Rohm-Haas) is stabilized by 2butoxyethanol or isopropanol. If Acusol is added to water the solution thickens. However, if the Acusol  
15 is first mixed with one of the alcohols it is stable in the presence of water. This discovery allows one to use a one-part instead of a two-part system (such as encapsulation of the Acusol).

A 100g one shot solution was prepared, which was diluted in a standard 100ounce TIDE (PROCTOR AND GAMBLE) bottle. The conventional cap on the existing type